CLAIMS:

What is claimed is:

1. An ink jet printhead for an ink jet printer, comprising a semiconductor substrate containing ink ejection devices, a thick film layer attached to the substrate, and a nozzle plate attached to the thick film layer, the nozzle plate containing a plurality of ink ejection nozzles corresponding to the ink ejection devices, and the printhead containing flow features having a height dimension and a width dimension formed therein for flow of ink to the plurality of ink ejection devices for ejection through the nozzles, wherein at least a portion of the flow feature dimensions for at least one of the nozzles is formed in both the thick film layer and laser ablated in the nozzle plate, and wherein the thick film layer contains at least 12 % of the flow feature dimensions.

2. The ink jet printhead of claim 1 wherein the flow features include an ink chamber and an ink flow channel in flow communication with the ink chamber.

3. The ink jet printhead of claim 1 wherein the printhead comprises substantially all of the flow features formed in both the nozzle plate and the thick film layer.

4. The ink jet printhead of claim 1 wherein the nozzle plate has a thickness ranging from about 25 to about 70 microns.

5. The ink jet printhead of claim 4 wherein the ink ejection nozzles have a bore length ranging from about 20 to about 65 microns.

6. The ink jet printhead of claim 4 wherein the thick film layer has a thickness ranging from about 5 to about 15 microns.

7. The ink jet printhead of claim 6 wherein the flow features have a height dimension ranging from about 5 to about 30 microns.

8. The ink jet printhead of claim 7 wherein about 20 to about 80 % of the flow features height dimension is formed in the nozzle plate.

9. The ink jet printhead of claim 1 wherein the flow features laser ablated in the nozzle plate have at least two different height dimensions.

10. A method for tuning an ink jet printhead to provide improved ink refill frequency for higher frequency ink ejection operation, the method comprising the steps of:

providing a semiconductor substrate containing ink ejection devices on a device surface thereof;

depositing a thick film layer having a first thickness on the device surface of the semiconductor substrate;

patterning and developing one or more ink supply channels and ink chambers having a first height dimension in the thick film layer;

attaching a laser ablated nozzle plate having a second thickness to the thick film layer, the nozzle plate containing a plurality of ink nozzles having a nozzle bore length, a plurality of ink ejection chambers having a second height dimension, and a plurality of ink supply channels having a third height dimension,

wherein the second height dimension and the third height dimension range from about 0 microns to about 40 microns, and wherein the first height dimension is at least about 12% of a total of the first height dimension and the second height dimension or the first height dimension and third height dimension.

11. The method of claim 10 wherein the second thickness of the nozzle plate ranges from about 25 to about 70 microns.

12. The method of claim 11 wherein the bore length of the nozzles ranges from about 20 to about 65 microns.

13. The method of claim 11 wherein the first thickness of the thick film layer ranges from about 5 to about 15 microns.

14. The method of claim 13 wherein a sum of the first, second and third height dimensions ranges from about 5 to about 30 microns.

15. The method of claim 14 wherein about 20 to about 80 % of the sum of the first, second and third height dimensions is formed in the nozzle plate material.

16. An ink jet printhead made by the method of claim 10.

17. An ink jet printhead comprising:

a semiconductor substrate having ink ejection devices thereon;

a thick film layer attached to the substrate and having first portions of ink flow features formed therein; and

a nozzle plate attached to the thick film layer opposite the semiconductor substrate, the nozzle plate defining ink ejection nozzles and containing second portions of ink flow features formed therein by laser ablation,

wherein the first portions are at least 12% of a total of the first and second portions.

18. The ink jet printhead of claim 17 wherein the flow features include an ink chamber and an ink flow channel in flow communication with the ink chamber.

19. The ink jet printhead of claim 17 wherein the nozzle plate has a thickness ranging from about 25 to about 70 microns.

20. The ink jet printhead of claim 19 wherein nozzle plate contains ink ejection nozzles having a bore length ranging from about 20 to about 65 microns.

21. The ink jet printhead of claim 19 wherein the thick film layer has a thickness ranging from about 5 to about 15 microns.

22. The ink jet printhead of claim 21 wherein the flow features have a height dimension ranging from about 5 to about 30 microns.

23. The ink jet printhead of claim 22 wherein about 20 to about 80 % of the flow features height dimension is formed in the nozzle plate.